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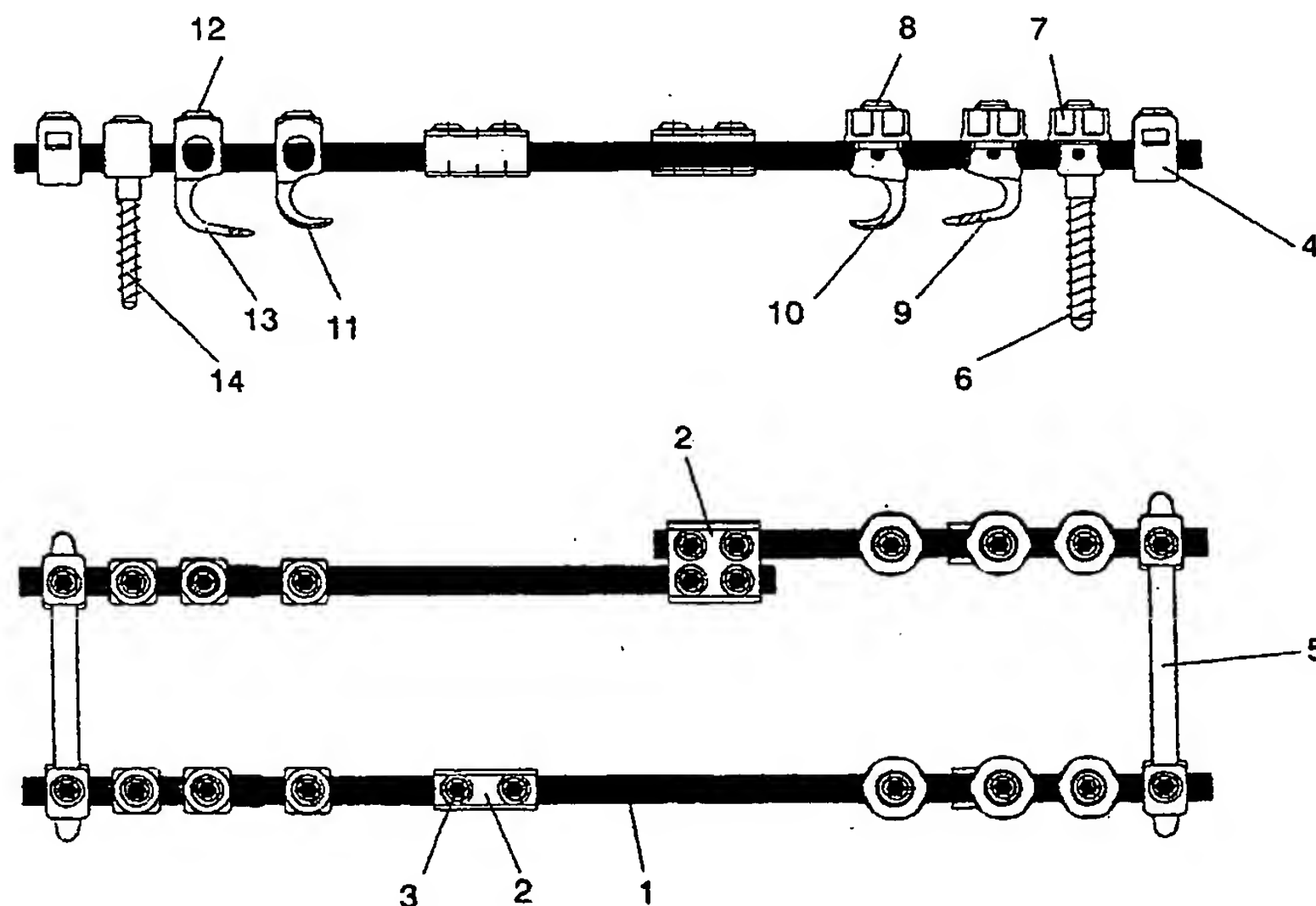
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[Continued on next page]

(54) Title: NEW SPINAL SYSTEM



(57) Abstract: New spinal system developed through this invention concerns implanted materials used in spine surgery and their application on bodies, and consists of rod, binder, transfer-stretching block and binder set screw, transfer-stretching block, transfer-stretching plate, open pedicular screw, cap, open systems set screw, open pedicular hook, open laminar hook, closed aminar hook, closed system set screw, closed pedicular hook, closed pedicular screw, socket, sacral block, sacral block screw and shim.

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NEW SPINAL SYSTEM

This invention concerns implanted materials used in spine surgery and their application in bodies.

The first important step on instrumentations of spine surgery has been taken by Harrington in the form of posterior instrumentation in 1960's. Following this, Vielke and Dwyer have initiated anterior spinal instrumentation. Dwyer's study has been conducted in 1969 and Vielke's study has been conducted in 1976.

Luke has developed segmental spinal instrumentation by means of circling wires in the beginning of 1980's. The following big step was CD's (Cotrell Debusse) in the form of introducing a 3-D view on spine surgery and developing CD instrumentation parallel to this. Many new version spinal systems have been developed in line with such basic principles today.

On New Spinal System, which has been developed by this invention, all properties of other posterior and anterior spinal systems have been taken into consideration and improvements on them have taken place. Such system includes static, dynamic and all properties in surgical operations and their combinations and it is surgeon's choice which one to use.

Drawings prepared for the purpose of explaining the new spinal system developed through this invention consist of the followings.

Figure 1- General view of new spinal system

- Figure 2- Technical drawing of rod
- Figure 3- Technical drawing of closed pedicular screw
- Figure 4- Technical drawing of open pedicular screw
- Figure 5- Technical drawing of closed pedicular hook
- Figure 6- Technical drawing of closed laminar hook
- Figure 7- Technical drawing of closed systems set screw
- Figure 8- Technical drawing of open pedicular hook
- Figure 9- Technical drawing of open laminar hook
- Figure 10- Technical drawing of open systems set screw
- Figure 11- Technical drawing of cap
- Figure 12- Technical drawing of socket
- Figure 13- Technical drawing of transfer-stretching block
- Figure 14- Technical drawing of transfer-stretching plate
- Figure 15- Technical drawing of binder
- Figure 16- Technical drawing of sacral block
- Figure 17- Technical drawing of sacral block screw
- Figure 18- Technical drawing of transfer-stretching block and binder set screw
- Figure 19- Technical drawing of shim

Pieces included in the figures and making up the invention have been assigned separate numbers in order to facilitate the explanation of the new spinal system. Numbers and definitions of pieces are given below.

- 1- Rod
- 2- Binder
- 3- Transfer-stretching block and binder set screw
- 4- Transfer-stretching block
- 5- Transfer-stretching plate
- 6- Open pedicular screw
- 7- Cap
- 8- Open systems set screw

- 9- Open pedicular hook
- 10- Open laminar hook
- 11- Closed laminar hook
- 12- Closed system set screw
- 13- Closed pedicular hook
- 14- Closed pedicular screw
- 15- Socket
- 16- Sacral block
- 17- Sacral block screw
- 18- Shim

New spinal system developed through this invention consists of rod (1), binder (2), transfer-stretching block and binder set screw (3), transfer-stretching block (4), transfer-stretching plate (5), open pedicular screw (6), cap (7), open systems set screw (8), open pedicular hook (9), open laminar hook (10), closed laminar hook (11), closed system set screw (12), closed pedicular hook (13), closed pedicular screw (14), socket (15), sacral block (16), sacral block screw (17), and shim (18).

Rod (1) are being used in the form of Titanium rods starting from a length of 60 mm to 360 mm in the system. Rods (1) are designed as special perforation profile and having a diameter of 6.8 mm, preferably.

Closed pedicular screws (14) used in this new system are of various length and preferably 35, 40, 45, 50 mm-long. Hole surfaces on the upper side of the screws (14) have been adjusted in accordance with the rod profile (1) and the top of the rod (1) passing here has been pressed by set screw (12) and stability has been provided in this way. It transmits the strength over the bone to the rod.

Open pedicular screws (6) used in this system developed through this invention are of various length and preferably 35, 40, 45, 50 mm-long. Hole surfaces on the upper side of the screws (6) have been adjusted in accordance with the rod profile and a nut called cap (7) has been added to the system in order to provide that the rod can be placed from the top in an easy way. Stability has been ensured by pressing on the top of the rod (1) by set screw (8). It transmits the strength over the bone to the rod.

The new spinal system developed through this invention includes three kinds of closed pedicular hook (13) in various lengths, namely short, medium and long. In closed systems, the surface of the cavity on the top has been adjusted in accordance with the rod (1) profile, exactly in the same way as closed pedicular screws (14) and stability has been provided by pressing over the rod by set screw (12). It transmits the strength over the bone to the rod.

The new spinal system developed through this invention includes three kinds of closed laminar hook (11) in various lengths, namely short, medium and long. In closed systems, the surface of the cavity on the top has been adjusted in accordance with the rod (1) profile, exactly in the same way as closed pedicular screws (14) and stability has been provided by pressing over the rod by set screw (12). It transmits the strength over the bone to the rod.

The new spinal system developed through this invention includes three kinds of open pedicular hook (9) in various

lengths, namely short, medium and long. In open systems, the surface of the cavity on the top has been adjusted in accordance with the rod (1) profile and a nut called cap (7) has been added to the system in order to provide that the rod can be placed from the top in an easy way. Stability has been ensured by pressing on the top of the rod (1) over the cap by set screw (8). It transmits the strength over the bone to the rod.

Surface of the connection parts of the rod (1) has been adjusted in accordance with the rod (1) profile as it is the case in screws and hooks. Stability has been ensured by pressing on the rod from the hole over the socket (15) through set screw.

After the establishment of the new spinal system developed through this invention, transfer-stretching plates (5), located between two rods in the system, are connected to the rods through transfer-stretching blocks (4) and set screws (3). In this way, strengths coming over the rods (1) are transmitted from transfer-stretching plates (5) to the rods (1) by such blocks. Strengths and loads coming to the rods are balanced.

After the establishment of the new spinal system developed through this invention, transfer-stretching plates (5) are used in order to balance the strength coming on the rods (1) and to prevent the movements of the rods (1) independently from each other. Strengths coming on the rods (1) are balanced and distributed through pressing the plates (5) by set screw (3) over the transfer-stretching blocks (4). In this way, system stability is ensured.

Within the new spinal system developed through this invention, connection of rods, which are or are not just enough, following each other, is provided through the binders (2). Binders (2) have been designed as single or double.

Within the new spinal system developed through this invention, the rod may be fixed on sacrum bone through sacral block (16). Sacral block (16) may be fixed on sacrum bone with three different angles. Stability is ensured by pressing on the rod (1) through set screw (3) over the hole on sacral block (16). The surface of the hole, which the rod will pass through, is adjusted according to the rod profile (1). Rotation of the rod on sacral block (16) has been prevented by means of the hole surface proper to rod (1) profile.

Sacral block screws (17) are being used in order to fix sacral block in the new spinal system developed through this invention. They are designed in different lengths and preferably 30-35-40-45-50 mm long and they are assembled within the system through AA3.5 AO screwdriver.

CLAIMS

- 1- New spinal system concerning implanted materials used in spine surgery and their application in bodies, which is characterized as consisting of rod, binder, transfer-stretching block and binder set screw, transfer-stretching block, transfer-stretching plate, open pedicular screw, cap, open systems set screw, open pedicular hook, open laminar hook, closed laminar hook, closed system set screw, closed pedicular hook, closed pedicular screw, socket, sacral block, sacral block screw and shim.
- 2- New spinal system, which is the same way as mentioned in Claim 1 and characterized with the production of the rod in different lengths from 60 mm to 360 mm and its manufacturing with titanium and its design in the form of a perforation profile with a diameter of 6.8 mm.
- 3- New spinal system, which is the same way as mentioned in Claims 1 and 2 and characterized with the closed pedicular screws being of various length and preferably 35, 40, 45, 50 mm-long, hole surfaces on the upper side of the screws being adjusted according to the rod profile and ensuring the stability by pressing the top of the rod by set screw and the strength over the bone being transmitted to the rod.
- 4- New spinal system, which is the same way as mentioned in Claims 1, 2 and 3 and characterized

with the open pedicular screws being of various length and preferably 35, 40, 45, 50 mm-long, hole surfaces on the upper side of the screws having been adjusted according to the rod profile and a nut called cap having been added to the system in order to provide that the rod can be placed from the top in an easy way and additionally, stability having been ensured by pressing on the top of the rod by set screw and the strength over the bone being transmitted to the rod.

5- New spinal system, which is the same way as mentioned in Claims 1, 2, 3 and 4 and characterized with the closed pedicular hooks being produced in various lengths, namely short, medium and long; in closed systems, the surface of the cavity on the top having been adjusted in accordance with the rod profile, exactly in the same way as closed pedicular screws and stability having been provided by pressing over the rod by set screw and the strength over the bone being transmitted to the rod.

6- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4 and 5 and characterized with the closed laminar hooks being in various lengths, namely short, medium and long; in closed systems, the surface of the cavity on the top having been adjusted in accordance with the rod profile, exactly in the same way as closed pedicular screws and stability having been provided by pressing over the rod by set screw and in this way the strength over the bone being transmitted to the rod.

- 7- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5 and 6 and characterized with the open pedicular hook being produced in various lengths, namely short, medium and long; in open systems, the surface of the cavity on the top having been adjusted in accordance with the rod profile and a nut called cap having been added to the system in order to provide that the rod can be placed from the top in an easy way and stability having been ensured by pressing on the top of the rod over the cap by set screw, so the strength over the bone being transmitted to the rod.
- 8- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6 and 7 and characterized with the open laminar hooks being produced in various lengths, namely short, medium and long; in open systems, the surface of the cavity on the top having been adjusted in accordance with the rod profile and a nut called cap having been added to the system in order to provide that the rod can be placed from the top in an easy way and stability having been ensured by pressing on the top of the rod over the cap by set screw and the strength over the bone being transmitted to the rod in this way.
- 9- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7 and 8 and characterized with the surface of rod connection parts being adjusted in accordance with the rod profiles as it is the case in screws and hooks, and

stability having been provided through pressing the rod by set screw from the hole on the socket.

10- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8 and 9 and characterized with the transfer-stretching plates located between two rods in the system, being connected to the rods through transfer-stretching blocks and set screws following the establishment of the system and in this way, strengths coming over the rods being transmitted to the rods from transfer-stretching plates by such blocks and so, strengths and loads coming to the rods being balanced.

11- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 and characterized with the use of transfer-stretching plates for balancing the strengths coming on the rods after the establishment of the system and preventing the movement of rods independently from each other, and balancing and distribution of the strengths coming on the rods through pressing the plates by set screw over the transfer-stretching blocks and ensuring the system stability in this way.

12- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 and characterized with the connection of the rods, which are or are not just enough, following each other within the system, through single or double binders.

13- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 and characterized with the fixing of rod on sacrum bone through sacral block.

14- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 and characterized with the fixing of sacral block on sacrum bone with three different angles, ensuring the stability by pressing on the rod through set screw over the hole on sacral block, adjustment of the surface of the hole, which the rod will pass through, according to the rod profile and prevention of the rotation of the rod on sacral block by means of the hole surface proper to rod profile.

15- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 and characterized with the use of sacral block screws designed in various lengths and preferably 30, 35, 40, 45 and 50 mm to fix sacral block.

16- New spinal system, which is the same way as mentioned in Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15 and characterized with the assembly of sacral block screws within the system through AA3.5 AO screwdriver.

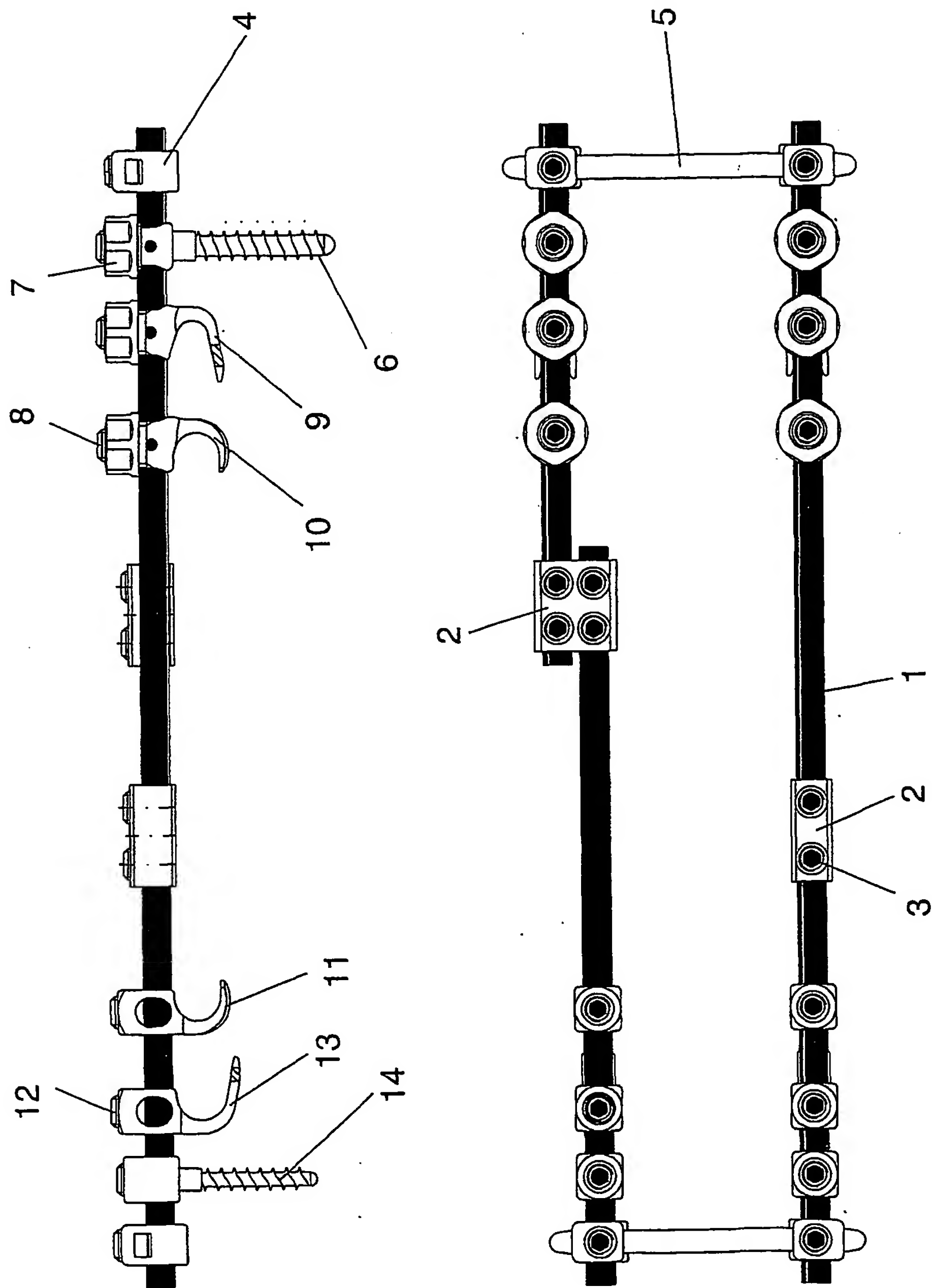


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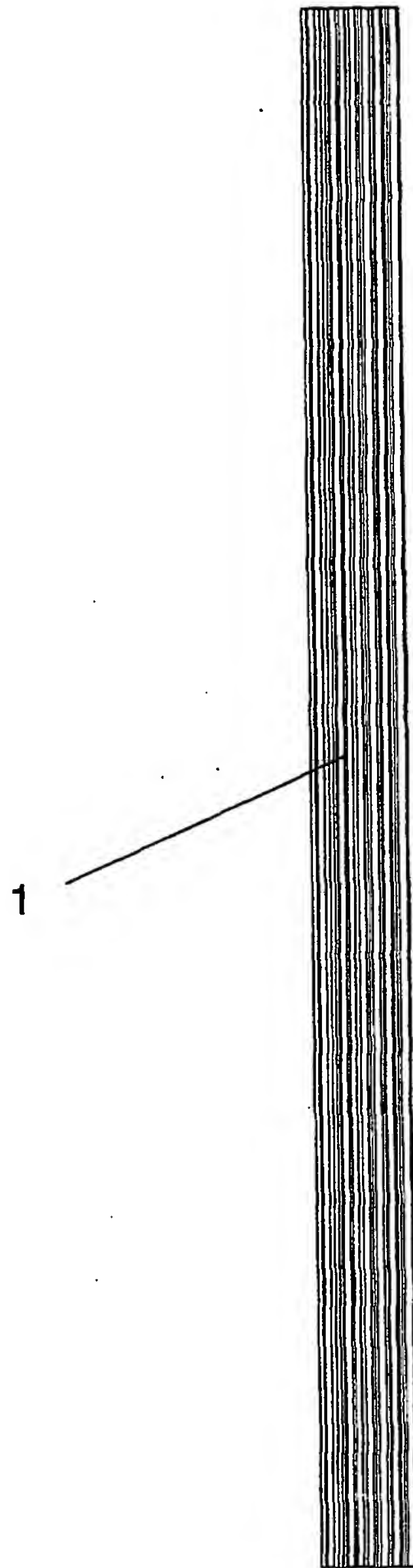


Figure 2

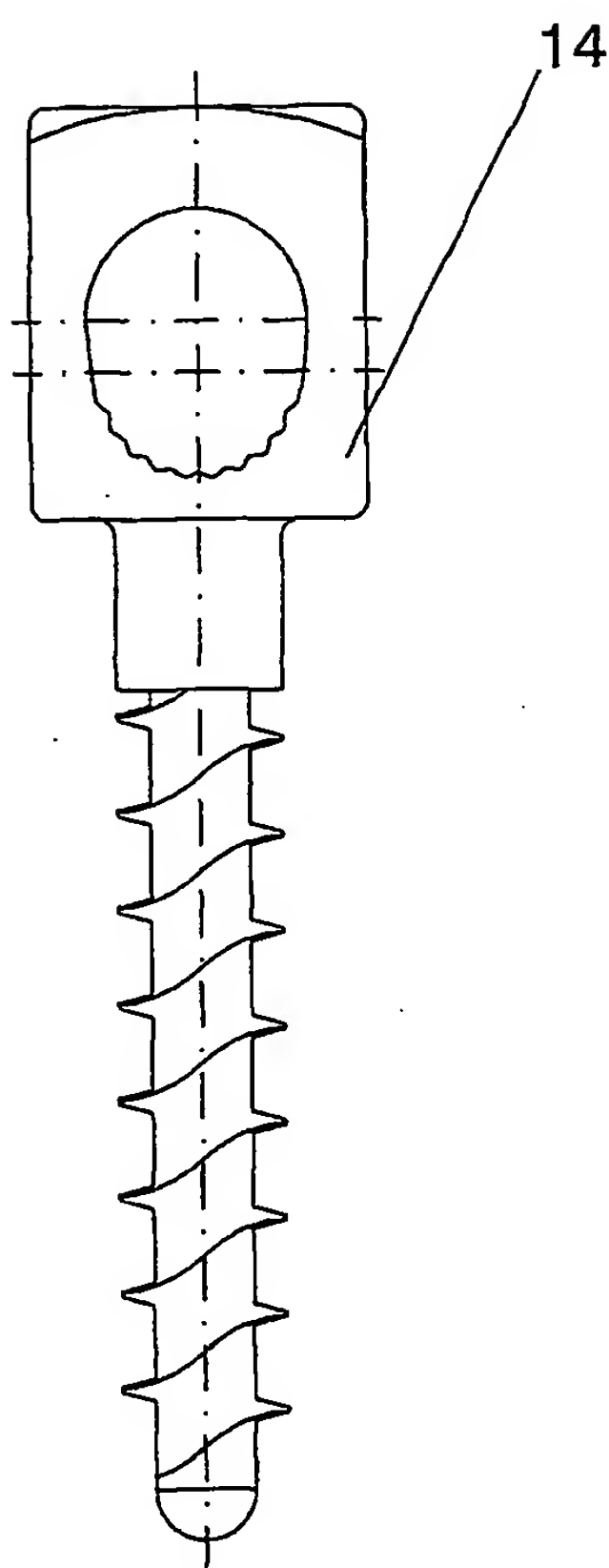


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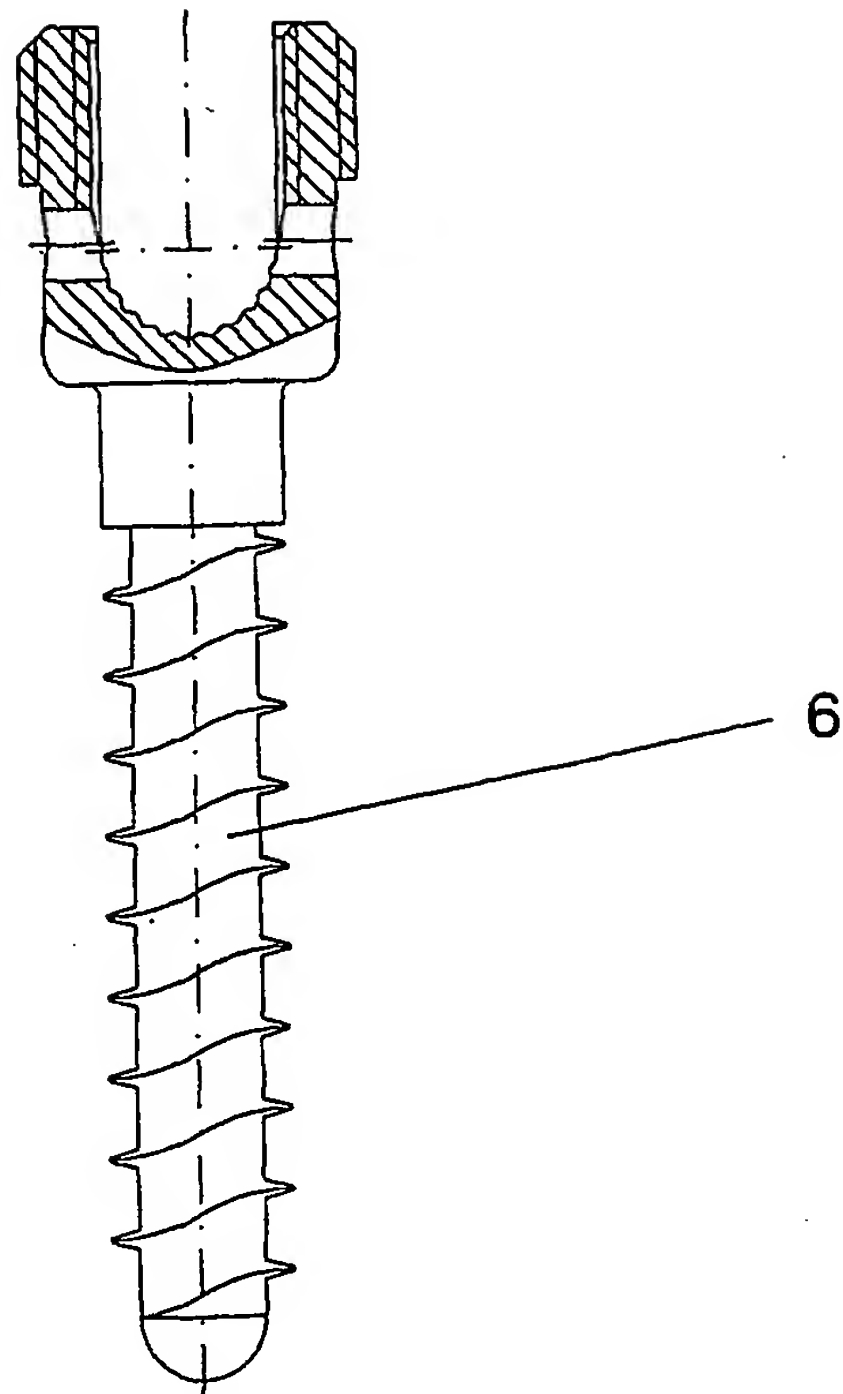


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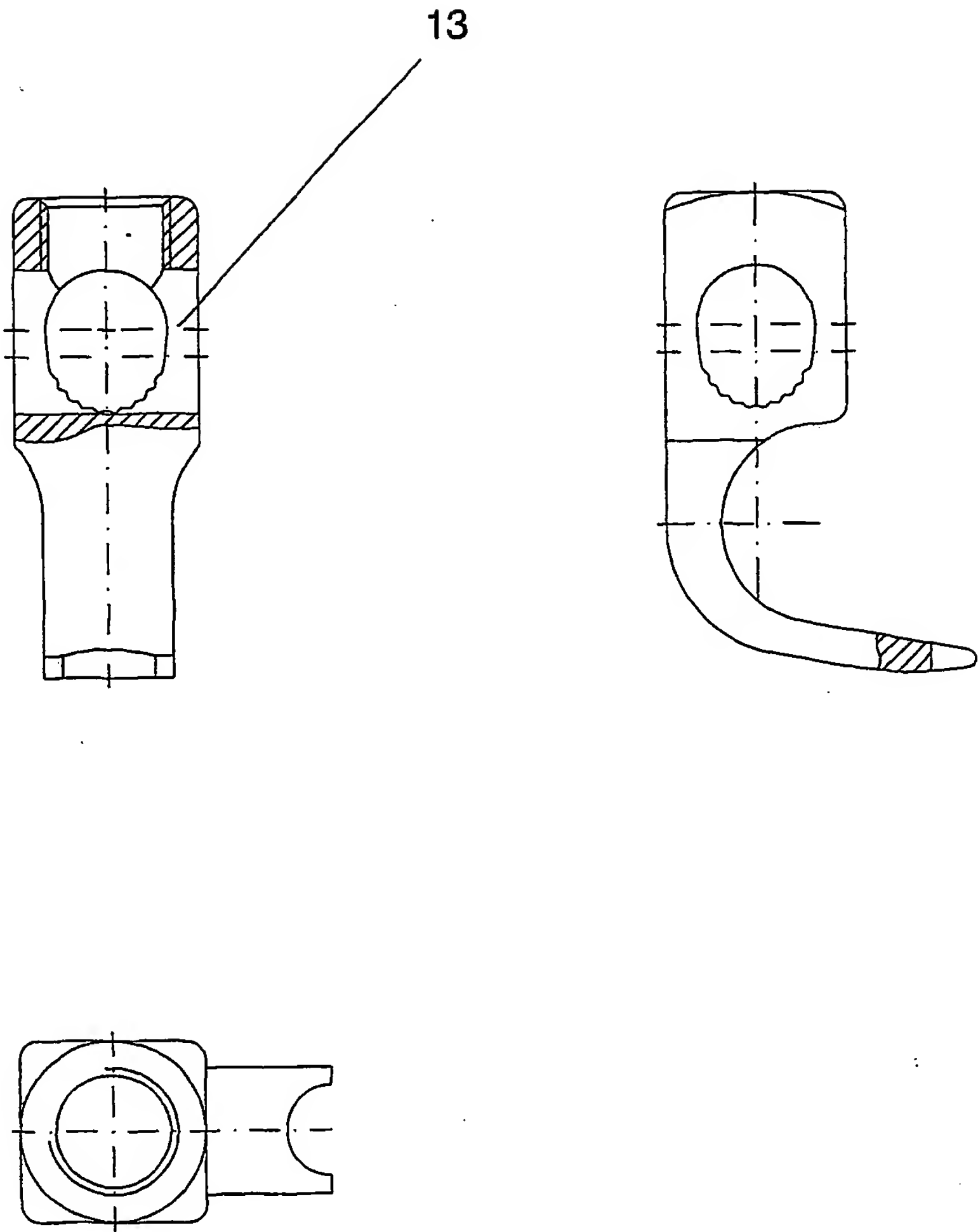


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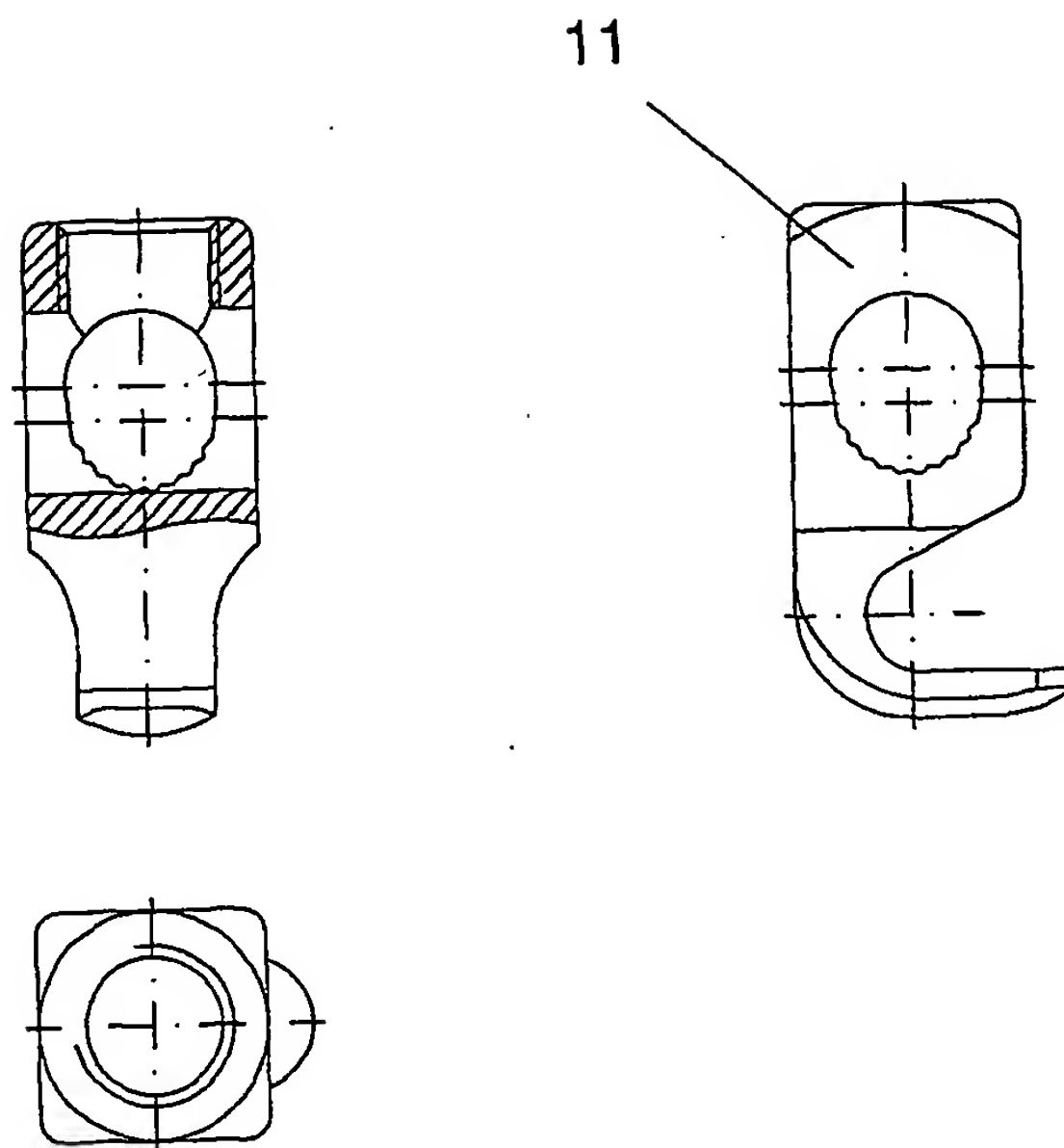


Figure 6

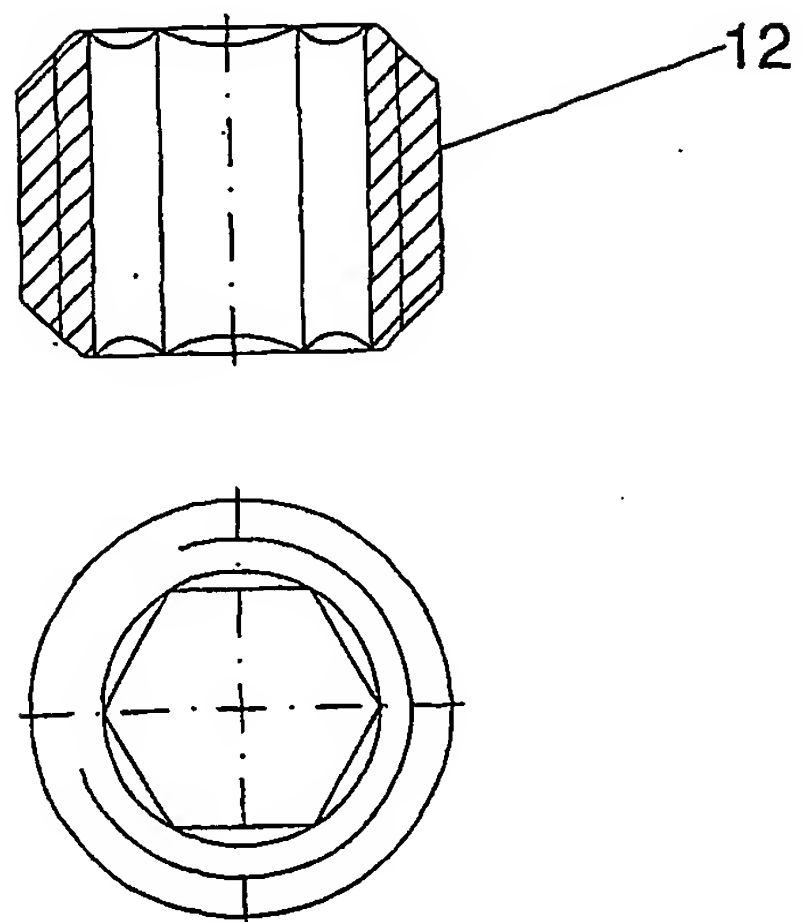


Figure 7.

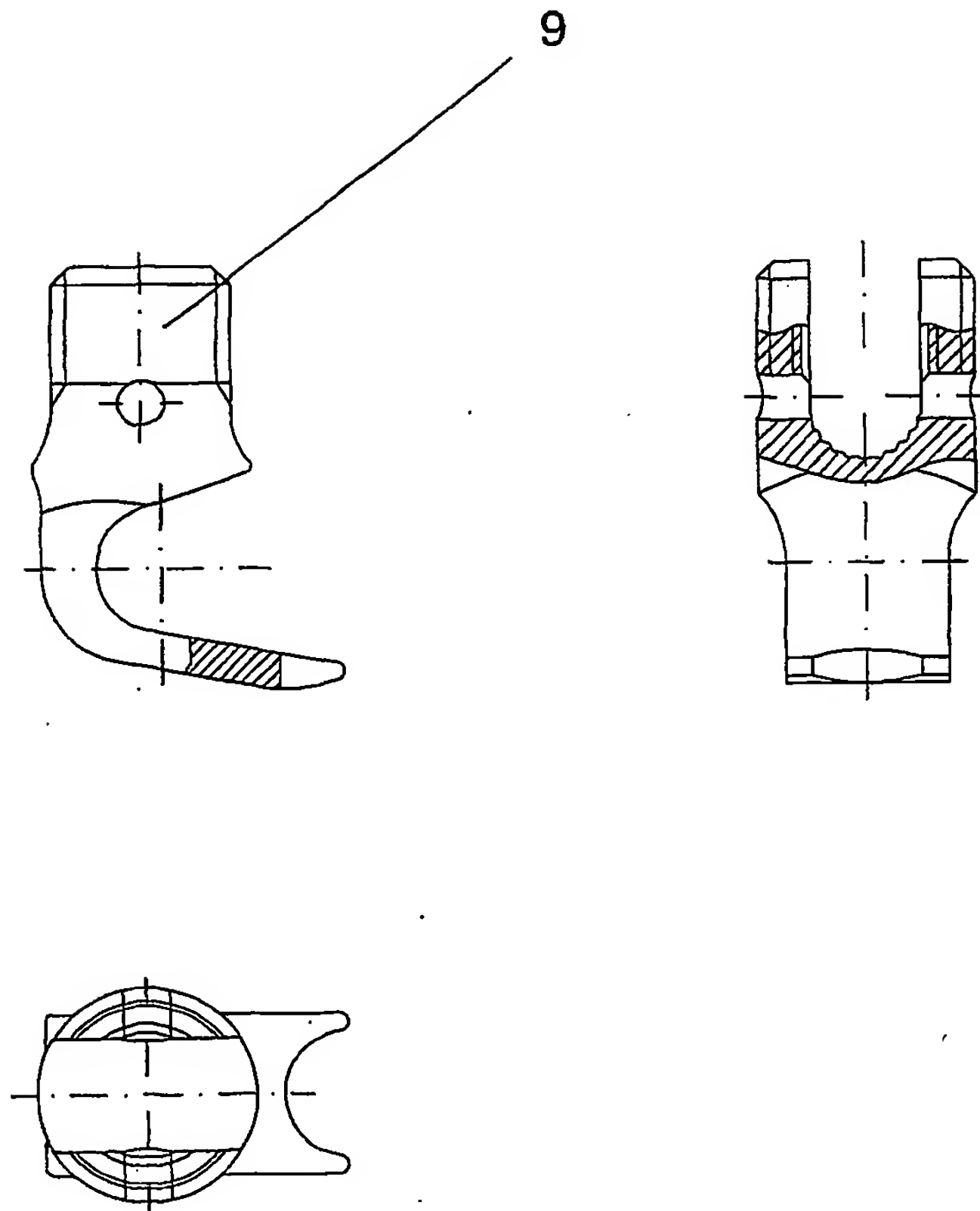


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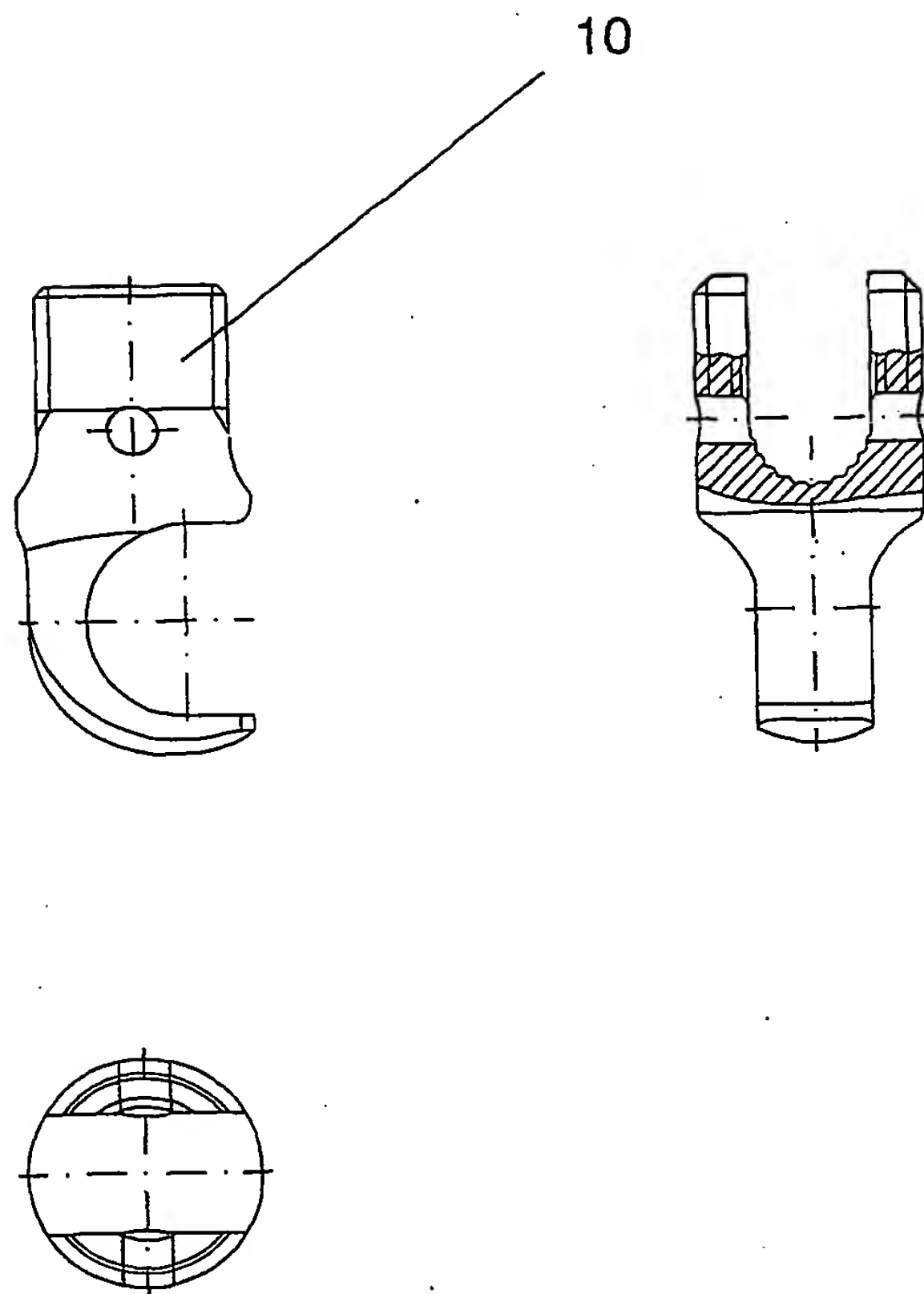


Figure 9

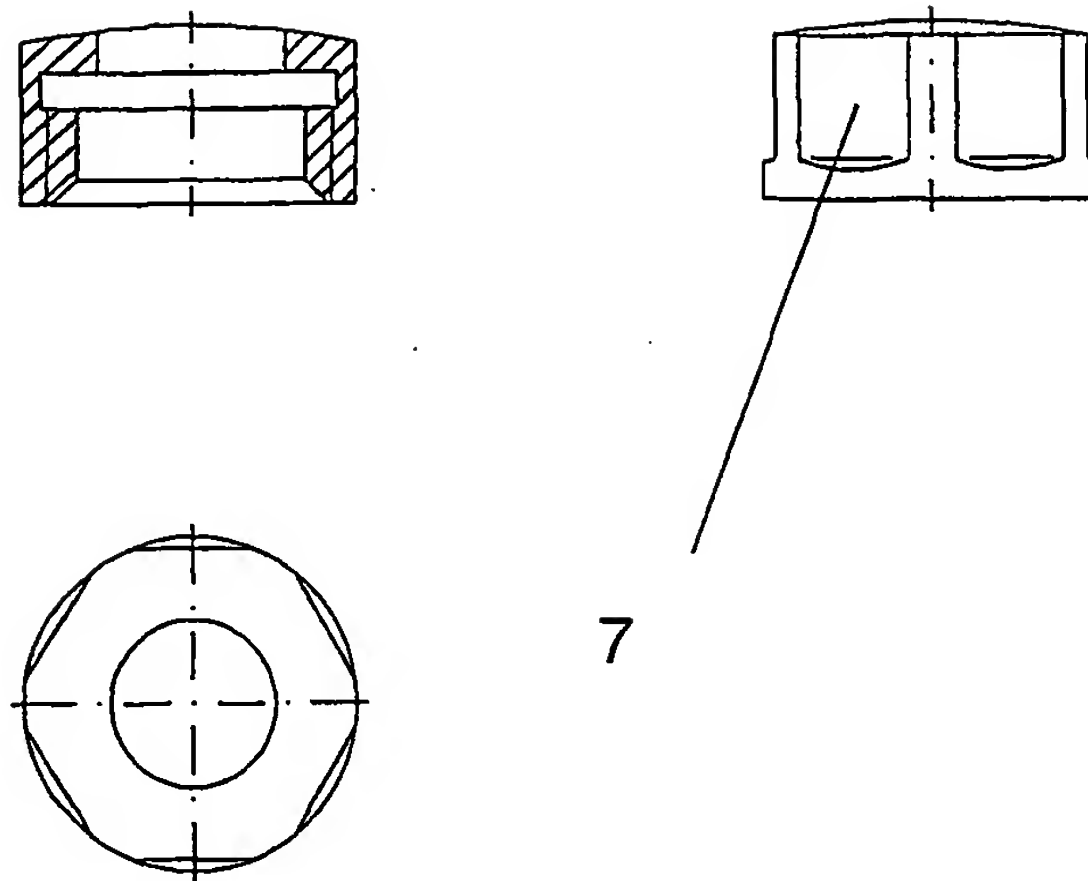


Figure 11

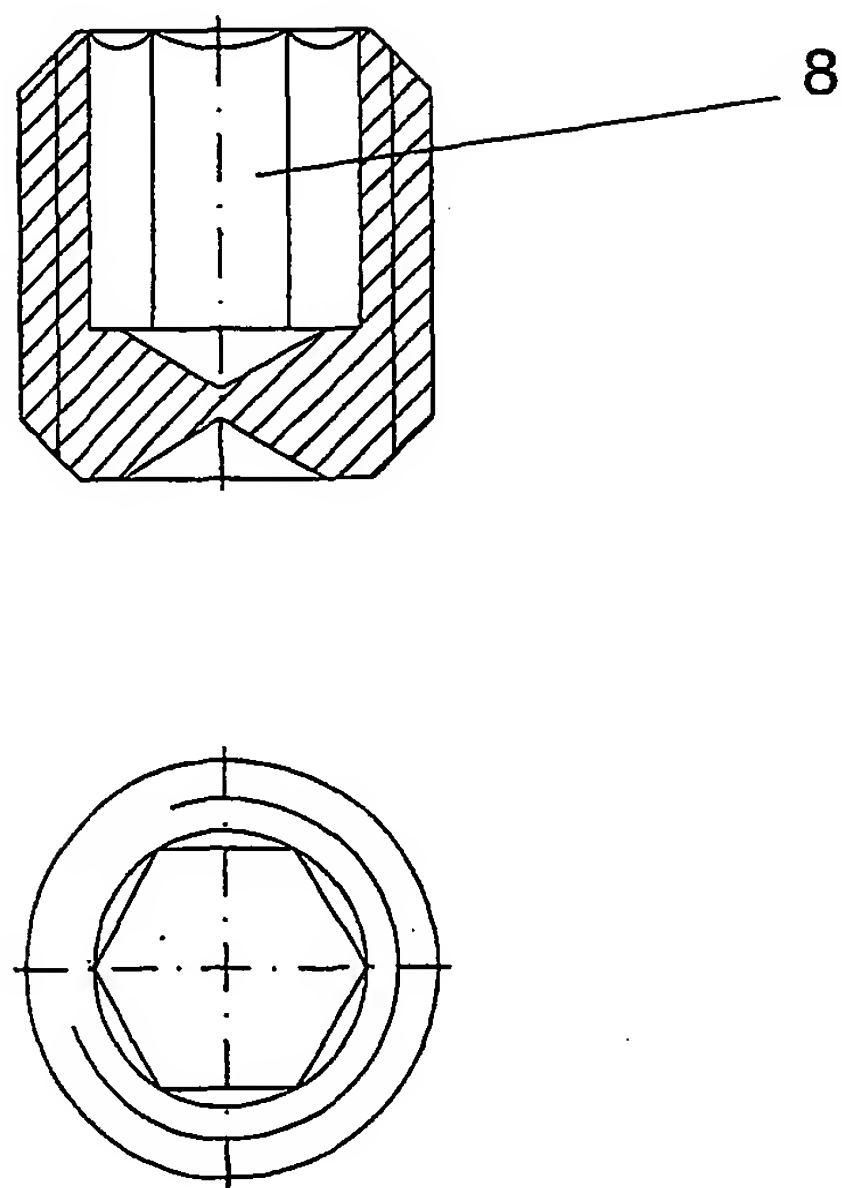


Figure 10

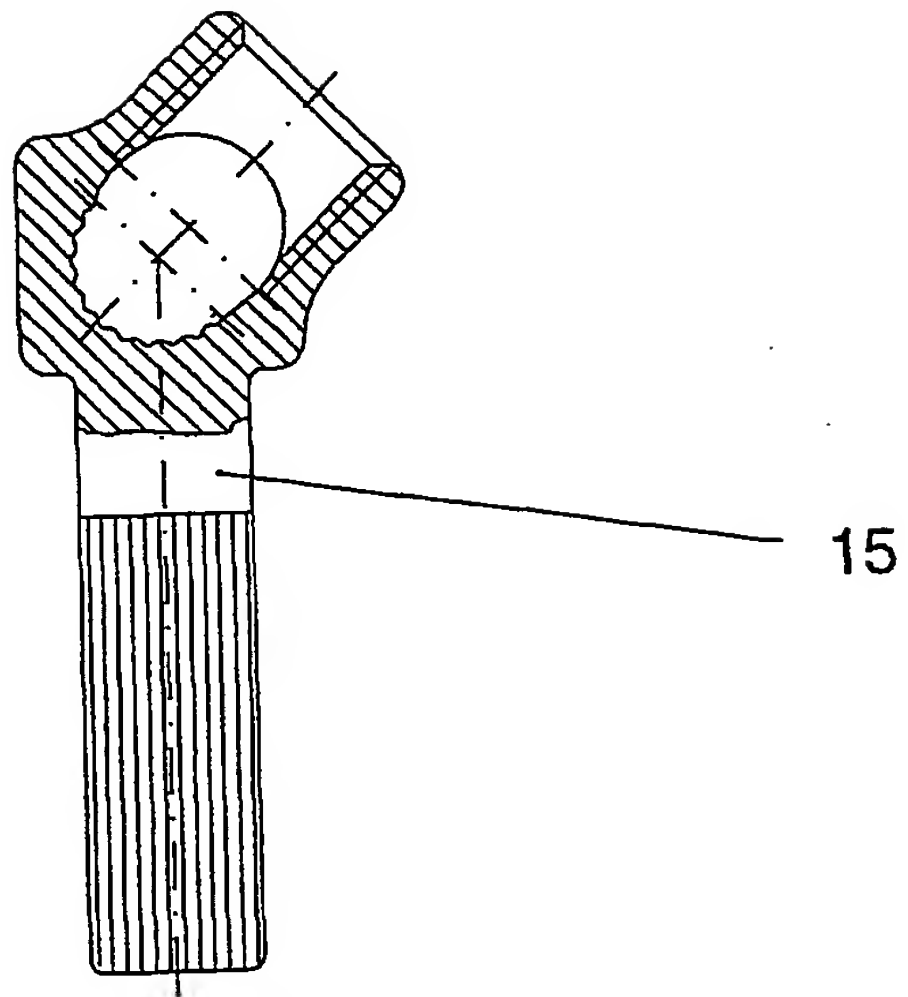


Figure 12

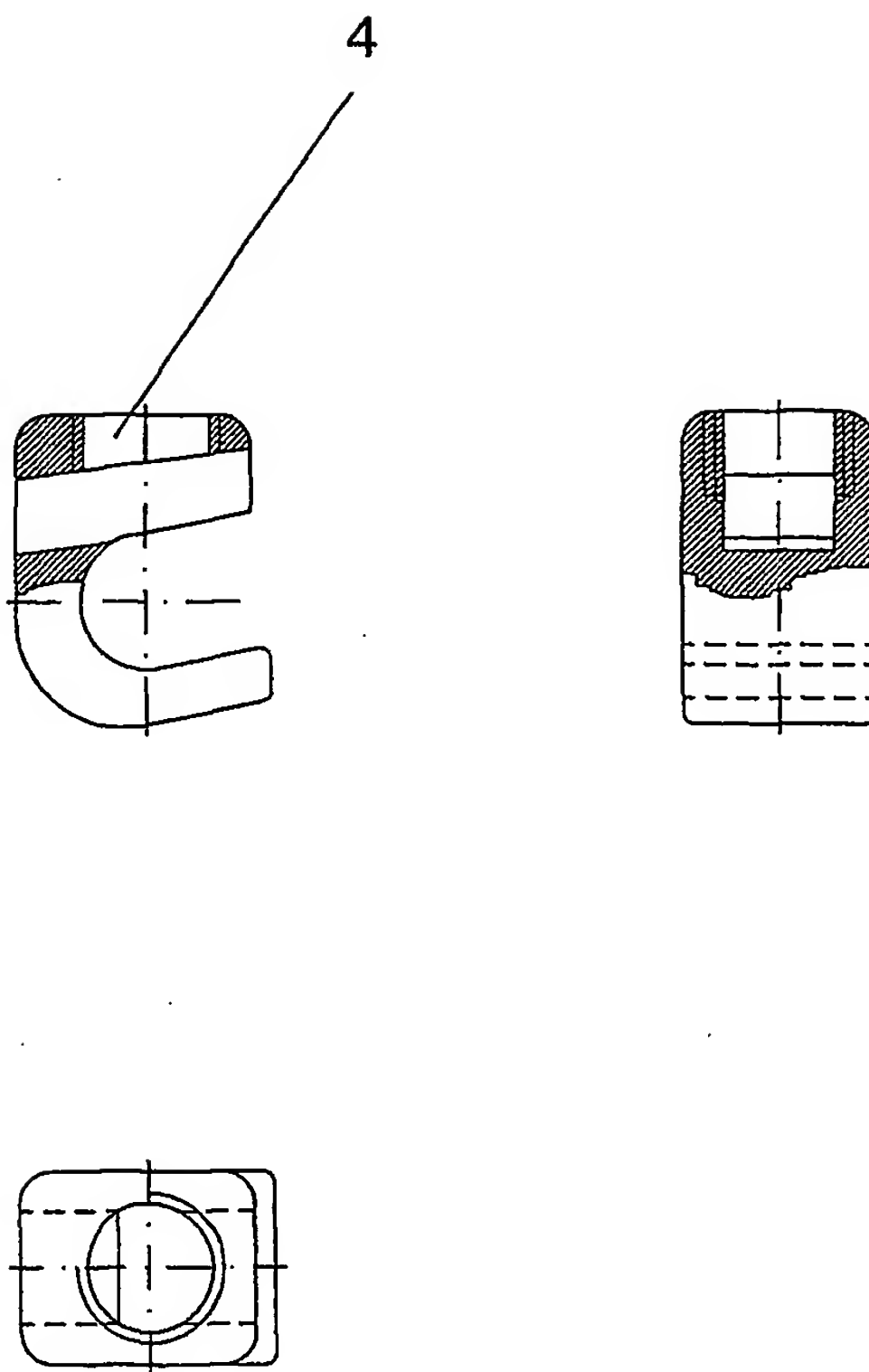


Figure 13

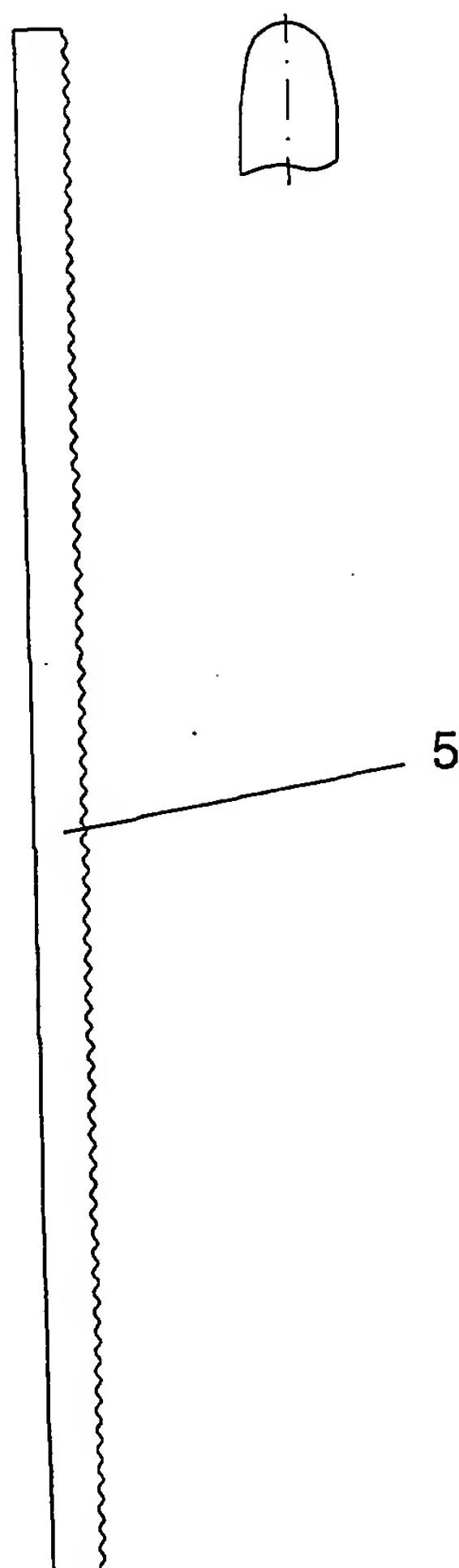


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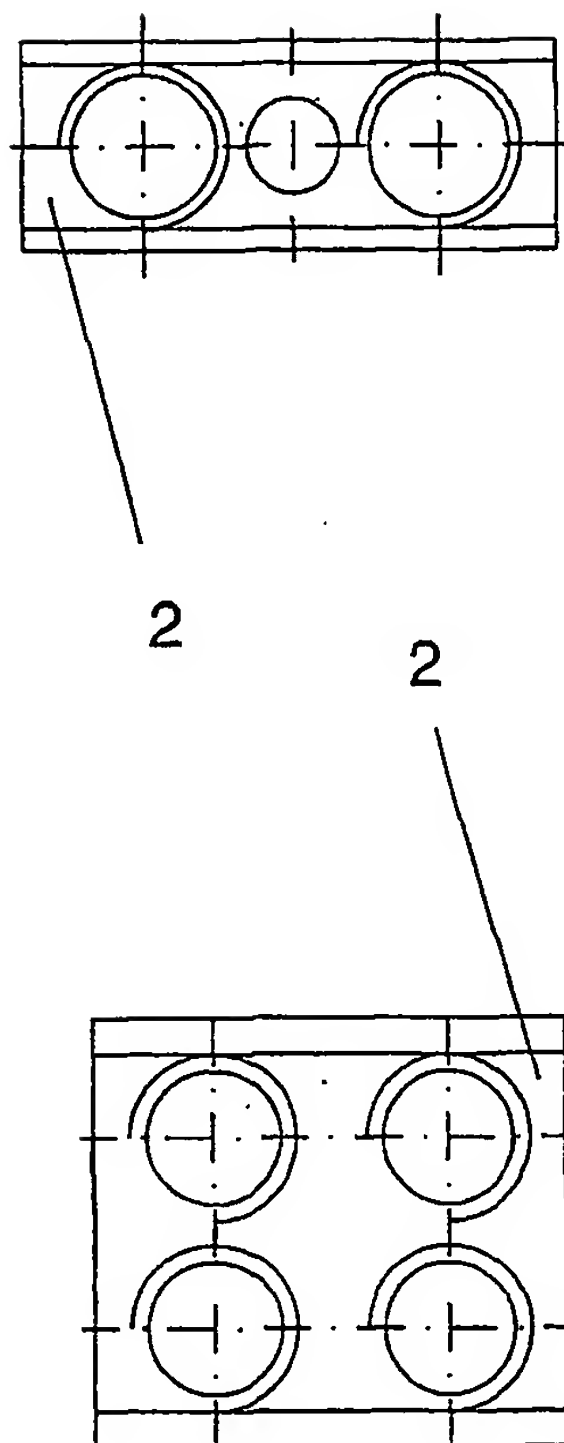


Figure 15

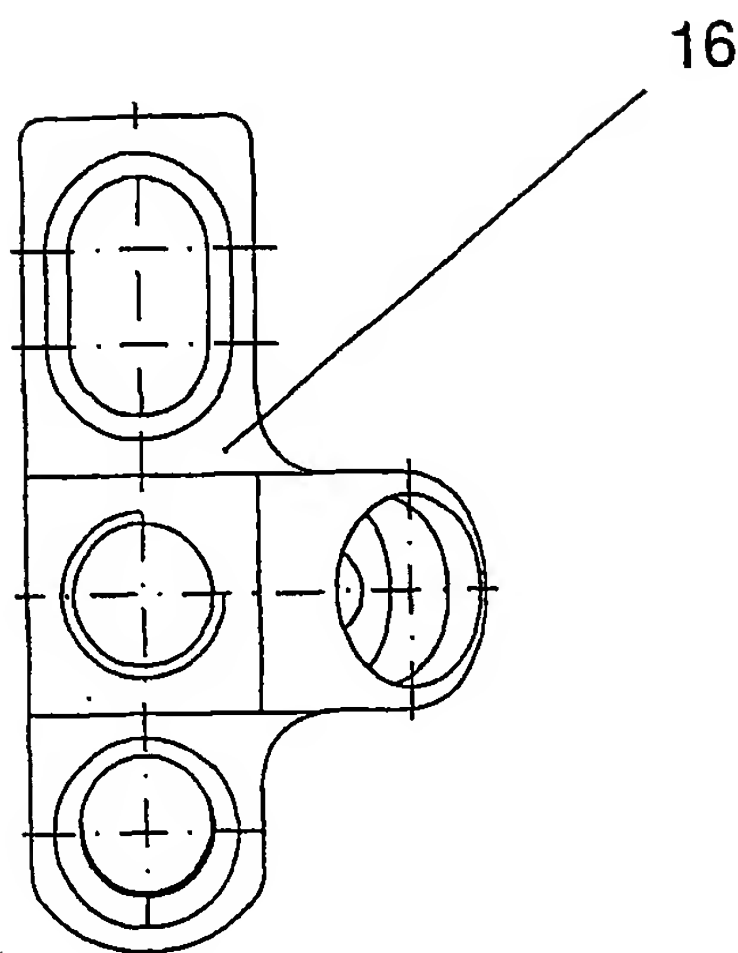
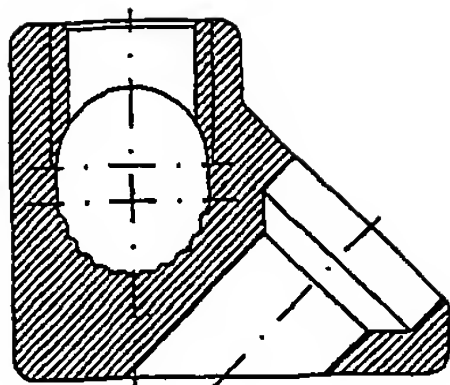


Figure 16

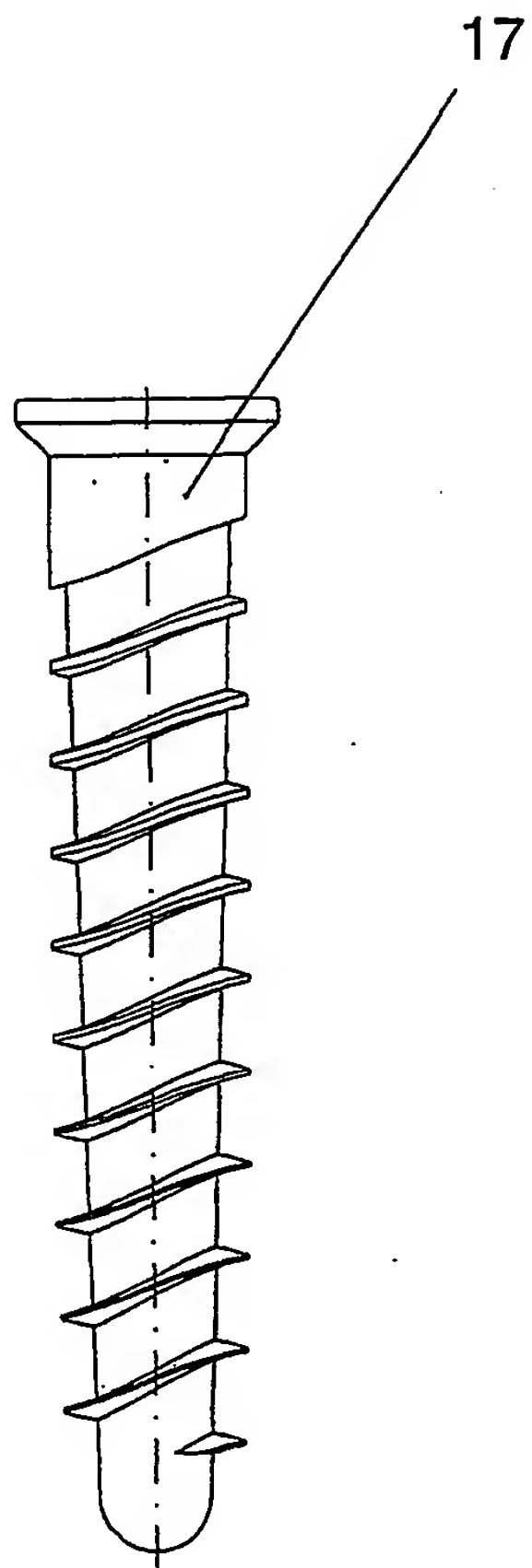


Figure 17

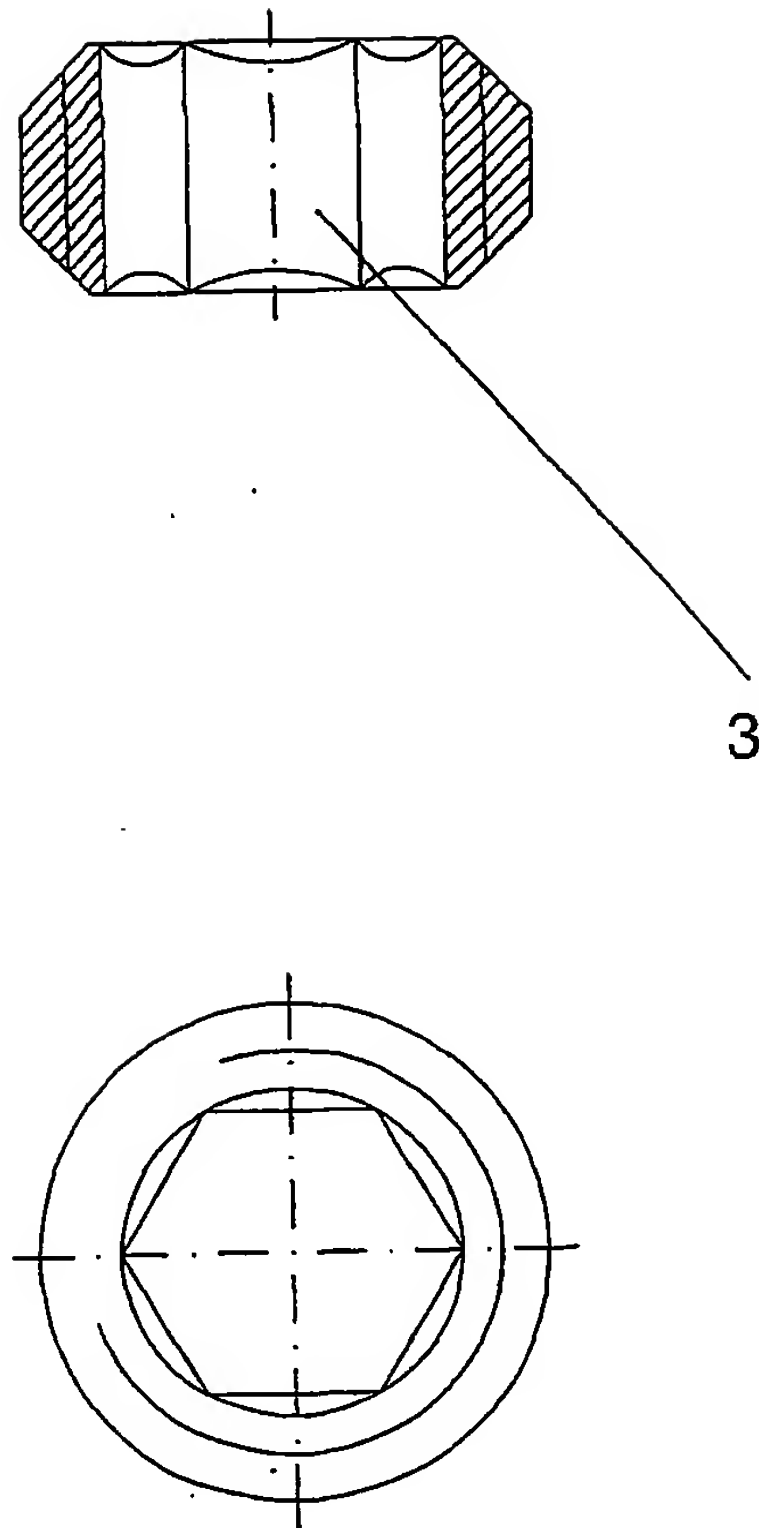


Figure 18

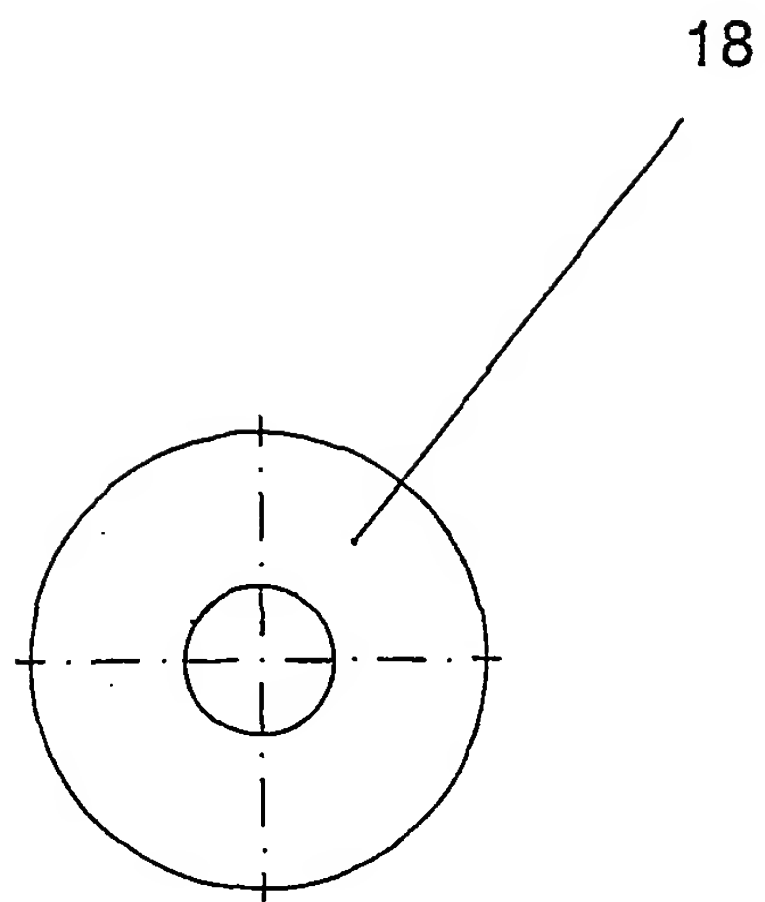


Figure 19

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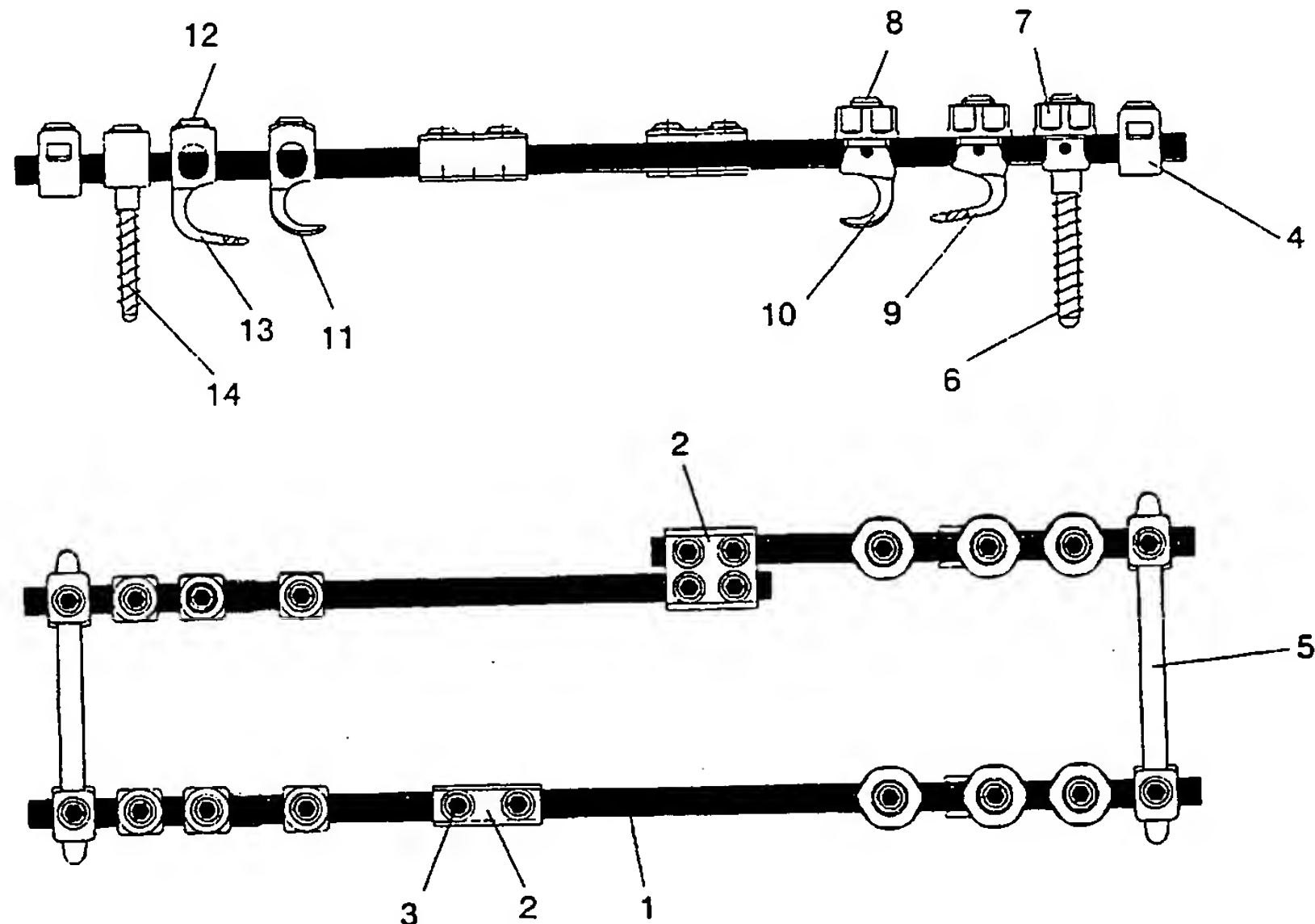
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LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,

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(54) Title: **SPINAL SYSTEM**



(57) Abstract: New spinal system developed through this invention concerns implanted materials used in spine surgery and their application on bodies, and consists of rod, binder, transfer-stretching block and binder set screw, transfer-stretching block, transfer-stretching plate, open pedicular screw, cap, open system set screw, open pedicular hook, open laminar hook, closed aminor hook, closed system set screw, closed pedicular hook, closed pedicular screw, socket, sacral block, sacral block screw and shim.

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Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

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